Vol. VIII. MARCH, 1902. No. 7.

THE AGRICULTURAL STUDENT

J. S. MORRILL N. S. TOWNSHEND

A MONTHLY MAGAZINE DEVOTED TO AGRICULTURAL EDUCATION.

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at the Pan-American Exposition, Buffalo, N. Y., 1901.

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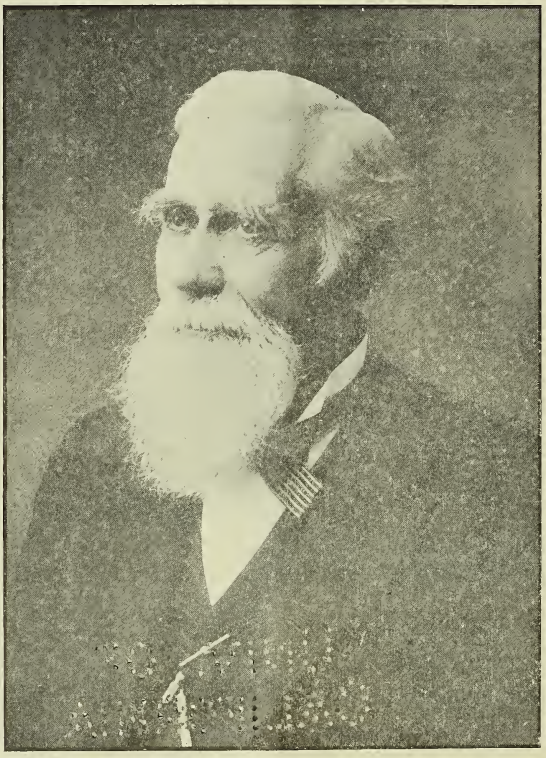
The World's Work for February.

THE WORLD'S WORK for February publishes entire, for the first time in America, Rudyard Kipling's "The Islanders," which has raised a veritable furore of discussion in England. Frank Norris, the author of "The Octopus," in an article entitled "The Frontier gone at Last," shows how the Anglo-Saxons have at last encircled the globe with conquest. Captain Mahan adds to an interesting series of papers which have appeared in various publications, one in THE WORLD'S WORK on "The Growth of Our National Feelings." George Iles, author of "Flame, Electricity and the Camera," writes Marconi's triumph. An intimate view of Dr. Lyman Abbott is given by Hamilton Wright Mabie, Dr. Abbott's associate on *The Outlook*, and the striking career and personality of Tom Johnson is described with particular reference to his work as Mayor of Cleveland. A plea for better wages for teachers is made by William McAndrew, and the consolidation of American railroads is described, with a colored map for illustration, by M. G. Cunniff. Some striking pictures of California big trees are accompanied by text written by Richard T. Fisher. Among the other illustrated articles are a description of the wonderful *La Prensa* the Buenos Ayres philanthropic newspaper; a story by Arthur Goodrich of how the Connecticut farmers are growing tobacco under tents, and "Gaucho's Day's Work," by William Bulfin, who wrote "Tales of the Pampas. Helen Lukens Jones' description of the greatest olive ranch in the world in California; the exciting experiences of the party who carried the United States mail farthest north in Alaska, by Dr. Francis H. Gambell, and a story of how the ice, last year, blocked traffic on the Great Lakes until May. Hugh H. Lusk tells of an interesting experiment in New Zealand for the prevention of strikes. "The March of Events and Among the World Workers," run over their usual wide gamut of topics of contemporary interest.



LUCIUS B. WING.

THE AGRICULTURAL STUDENT.

VOL. VIII. OHIO STATE UNIVERSITY, COLUMBUS, MARCH, 1902. NO. 7.

TERMS OF SUBSCRIPTION:

One Year	$0.50
One-half Year	.30
Single Copies	.05

While this magazine is published with the approval of the President of the University and the Officers of the College of Agriculture and Domestic Science, the editors are responsible or the statements in all unsigned articles.

Address all communications to the Business Manager, Agricultural Student, Columbus, Ohio.

Entered at the Post-Office, Columbus, Ohio, as second-class matter.

PUBLISHED MONTHLY BY

THE AGRICULTURAL STUDENT PUBLISHING COMPANY.

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CONTENTS.

EDITORIAL CHAT.

In the death of Lucius B. Wing the Board of Control of the University loses a sage counselor and THE STUDENT a trusted friend. Throughout his three terms as a trustee of the University, Mr. Wing was ever mindful of the welfare of the Agricultural Department, while his services on the farm committee began with his appointment as trustee and ended only with his death. His wise counsel in all matters connected with the agricultural side of the University will be sorely missed. His interest in agriculture was lifelong, and his services in its behalf were of no small moment. Immediately preceding his appointment as trustee he served three years as a member of the State Board of Agriculture and came to the office admirably fitted for his work in connection with the Agricultural Department of the University. It was largely through his efforts that the department was enabled to attain the proportions which exist today.

The pages devoted to his remembrance in this issue are but an insignificant token of the honor and respect due him for his valuable services.

The prospectus for the Graduate School of Agriculture is now being mailed to those whom it is hoped will be interested. Cards are also being mailed, by means of which it is expected to gain an idea of the number of persons who will attend. Several have already expressed an intention of taking the work, and it is expected that a large number will take advantage of this rare opportunity which is to be offered. Anyone interested in the work who has not received a copy of the prospectus may receive the same by application to Professor Hunt.

We are in receipt of the first number of the Iowa Agriculturist, a monthly magazine published by the students of the Iowa Agricultural College. Judging from the initial copy, a high standard is to be maintained, as both the number and character of the articles indicate. It is well arranged, carefully edited, and on the whole presents a most pleasing appearance. Our best wishes are extended to the new magazine for its most complete success and continued prosperity.

Now that the Experiment Station bill is a law we hope for an amicable adjustment of the unfortunate affair which has developed in connection with the station. The new plan seems on the face of it to be obviously better than the old, and it is hoped that it will have the effect of giving a much better control of affairs than has been possible so far. The advisability of removing both the governor and director from the board of control can surely not be questioned..

We note with interest the efforts which are being put forth by several of the smaller institutions of the State to prevent any additional appropriations to the University this year, by the General Assembly. It is the old story of a struggle for existence and will doubtless culminate in the survival of the fittest. It is a shortsighted policy that would seek to cut down the appropriations of the foremost institution of learning in the State, and we hope that the legislators will see the matter in this light. Our western State universities are coming to be the foremost institutions in the land and Ohio must keep pace with the times. A sectarian school may have its place, but it should not seek to destroy the power and prestige of these rapidly-advancing children of the State.

We congratulate the dairymen of the country on the passage of the oleomargarine bill by the House of Representatives. Although the bill has some adhering amendments which were fastened to it by its opponents, they do not appear to be of much real consequence. While the bill has been worked over by so many different men that we have almost forgotten the originator, yet it is essentially the old Grout bill with some marked warpings to make it fit circumstances.

It is sincerely hoped that the Senate will see fit to pass the measure either as presented, or better still, shorn of some of its amendments. There will undoubtedly be a strong fight here and any expressions by dairymen as to their desires, if properly urged upon the senators, may aid greatly in bringing about the desired result.

Lucius B. Wing.

Lucius B. Wing, who, for over twenty years, was a member of the Board of Trustees of the University, died at his home in Newark, Ohio, February 1, 1902.

In the death of Mr. Wing the Board of Trustees loses a wise counselor and the University a true friend. Throughout his career as a trustee, no one could have been more careful in seeking the highest good of the University, and none more regular in attendance upon all duties connected with the position. His ripe business experience, his excellent judgment and his natural ability for managing affairs, made him well fitted for the office which he so long has filled. His long life was one of uprightness and his conduct was always guided by a most conscientious adherence to principles of right as he saw them. The University mourns his loss with a keen sense of bereavement, and although we must necessarily bow to the inevitable, it is with extreme reluctance that we do so in such cases as this.

Mr. Wing's early life was spent on a rough New England farm, and from the experience there gained, as well as from characteristics inherited from parents peculiarly endowed with uprightness of character and sturdiness of purpose, he came into possession of those qualities which made his life of so much value. He one time said: "Inasmuch as man does not choose his parents or the place of his nativity, I do not consider that either is the subject of glory or shame. Still if I could have chosen mine I am sure I would not have selected any other."

The old homestead in Vermont is still in the family, where it has been for almost two and a half centuries, and as he once said in a beautiful description of the old place: "It is the mecca towards which, in later years the steps of many a wanderer is annually turned."

Mr. Wing always maintained a live interest in agriculture and in his work as a trustee was especially desirous of promoting the agricultural interests of the University. At an address delivered in the old chapel, February 22, 1887, in speaking of the value of agricultural education, he said: "We desire to have it proclaimed from the housetops that we hunger and thirst for more young men in the Departments of Agriculture and Horticulture. The proportion is increasing, but we are equipped for larger classes. * * * These young men will become the apostles of agriculture where they reside. The father will encourage the son, and partnerships will result, or a division of the homestead, so that father and son may remain near each other, and by improved methods, improved live stock, and possibly through improved legislation better returns will be secured upon the old business. The farm which the father has hewn out of the wilderness will remain in the family instead of becoming a burden and a grief in his old age under the mismanagement of tenants and hired help.

"I appeal to gentlemen learned in statecraft if the uneasy longing of young men to crowd to the cities, to seek clerkships, to accept employment upon railroads, to work for somebody else on stated salaries, rather than to use their hands and brains for themselves, is not a condition of things to be deprecated and discouraged.

"My appeal is that the wooded hills, the fertile valleys, the springs and water courses of our State be more fully occupied, improved and appreciated as homesteads."

Memorial exercises were held in the University Chapel, Wednesday, February 12, at which Thomas J. Godfrey and

Secretary Cope delivered addresses and the memorial as drawn up by the Board was read by John T. Mack.

Mr. Godfrey's address consisted largely of personal reminiscences and was in part as follows:

Lucius B. Wing became a trustee on the 13th day of May, 1881. Seven years ago he was much disposed to decline another term;—he said a man should know when to quit. In his disposition to discontinue his service he stood alone. Trustees, Faculty, everybody insisted that he accept another term. After several solicitations he half-consented. The governor being notified of this fact, the appointment was readily and cherfully made, and next May would have rounded out his three terms of seven years each.

I was somewhat acquainted with Mr. Wing before he was a trustee, and during his long service here we were intimate, even confidential, friends. He seldom missed a meeting of the Board or of any committee of which he was a member. I knew him so well and had such confidence in his judgment, his frankness and his integrity, that in the consideration of important matters, I felt safer when he was present and gave the rest of us the benefit of his counsel. He gave his opinions with that candor and earnestness that frequently—I may almost say usually—carried conviction. * * * He came to meetings after mature thinking on subjects to be discussed and was well fortified with reasons for his conclusions.

The effort of his life, so far as the University is concerned, was a speech he made in 1892 before a legislative committee pending the consideration of a joint resolution providing for the extension of Neil avenue to the north line of the University grounds. The street was to run west of the main building, be 80 feet wide and a franchise was to be given a street railway company to lay and operate a double track on said street to Woodruff avenue. Mr. Wing had given the scheme such thought, had gathered the facts so studiously, that he went before the committee eminently equipped for presenting reasons why the street should not be made. The speech was about the last heard of the 80-foot street with railway attachment.

Mr. Wing was a stickler for Shorthorn cattle—I owned some Jerseys. We frequently twitted each other on the respective merits of our cattle. One of my herd was vicious—it was dangerous for a stranger or even any one to go in his pasture. I told Mr. Wing that that animal was doing good service in keeping the boys away from my falling hickory nuts. He replied that he was pleased to hear that a Jersey was good for something.

For some time Mr. Wing did not always walk with the other trustees over the campus or farm, and when sessions ran far into the night he excused himself by saying, "Good men are getting scarce, and I must take care of myself."

Perhaps in the history of this institution—certainly since the reorganization and change of name in 1878—Mr. Wing was the second trustee to die. General Hayes was the first.

The dedication of The Makio for 1898 appropriately reads:

"To our honored and beloved trustee, Lucisu B. Wing, whose untiring effort and unselfish devotion have contributed much toward perpetuating our University as an institution of learning, this volume is gratefully dedicated as an inadequate expression of the indebtedness of the University to one of its most devoted friends."

Mr. Wing was strong in his likes—temperate in his dislikes. He had humor without sarcasm. Many of his pert sayings, if spoken by others, would

have left a sting. He made no heart bleed.

"None knew him but to love him,
None named him but to praise."

Captain Cope's address was from the standpoint of an old acquaintance and a co-worker. He said in part:

"The University from the beginning has been fortunate in its Boards of Trustees. They have been composed largely of men of affairs, and many of them have been distinguished for private virtue and valuable public service.

"It is the deliberate judgment of his associates, and of others having opportunity to form a correct opinion, that no trustee of the University has rendered more faithful or valuable service than Lucius B. Wing.

"He was appointed a member of the Board in 1881, was reappointed in 1887 and again in 1895, and at the time of his death had nearly completed twenty-one years of service.

"His first appearance was at the June meeting in 1881, at which meeting he was elected a member of the executive committee. All the years of his service except one he was a member of this committee, and at the time of his death had nearly completed fifteen years of continuous service as its chairman. When we remember that in the absence of the Board its functions are largely performed by the executive committee we realize the significance of this long period of service on such committee.

"He was also a member of the farm committee during his entire period of service. He was elected president of the Board in 1886 and again in 1893.

"Fortunately for the University he resided but a short distance away and was within easy call in case of an emergency. He was faithful in his attendance at meetings of the Board and the committees on which he served, and was quick to respond at other times when his presence and counsel were needed. He took an active and appreciative interest in everything connected with the University. He sought to know personally every member of the faculty and every employe. He kept in touch with all the various features of University life, was interested in the literary societies, the fraternities, the Lantern, the Makio, the glee club, the dramatic club, in base ball, and in foot ball, and sometimes lent a helping hand when careless management in some of these organizations left them in financial distress.

"Membership on the farm committee brought him into close relations with the agricultural department and he took a lively interest in the growing crops, in the horses, cattle, pigs and poultry.

"To the deliberations of the Board and committees he brought rare tact, strong common sense, good judgment and practical foresight. He was a good listener and withheld his decision until he had heard all that could be said on both sides of a question. Even after a decision had been reached he kept his mind open to new facts or arguments and was always willing to reconsider action which had been taken unadvisedly.

"He was rather difficult of speech and did not talk much, but when he did speak all gave attention, for he usually said the wise and timely thing. His associates had great respect for his opinion and great confidence in his judgment.

"When Mr. Wing was appointed a trustee of the University he had just completed three years of service as a member of the State Board of Agriculture, and quite naturally regarded himself as a special representative of the agricultural interests of the State. He believed that in the curriculum the branches relating to agriculture and the mechanic arts should have foremost

place, and his efforts were directed mainly towards the expansion of the industrial side of the institution. It was largely by his efforts that the department of agricultural chemistry was established and the college of agriculture otherwise strengthened, and finally expanded to its present noble proportions. But he was broadminded enough to conceive of an institution where all branches of science and learning could be taught in sympathetic and harmonious connection. To this idea he gave his cordial and unwavering support.

"In an address delivered in the old chapel, February 22, 1887, he said among other things: 'Let nobody's heart be troubled because this University offers to the students in agriculture and mechanic arts instruction in philosophy and the languages. Greek roots and beet roots are not necessarily antagonistic. Brain culture and agriculture can go together, and the first is just as essential for the proper development of the last as for any of the trades and professions.

"While difficult of speech, as stated, in his written communications he was singularly clear and forceful. His letters and addresses are models of good English and show a felicity of expression which is rare.

"It has been said that in old age Nature dims the sight, dulls the learning, deadens the other senses and kindly loosens one by one the cords that hold her children to earth and to interest in earthly things, and so prepares them for the final change. Such did not seem to be the case with our beloved friend. He retained the same warm interest in everything about him, and especially in the University up to the time of his death.

"Of Mr. Wing's personal characteristics it is difficult to speak. The ordinary words of eulogy are inadequate to discribe a character so unique. He had the stern vigor and virtue drawn from the New England hills where he was born, tempered and softened by the breeziness of the western prairie where his later farm life was partly spent. His nature was so rugged and strong yet so gentle and sweet that one is tempted to say of him what one of our modern poets said of one of his beloved contemporaries: When Nature was shaping him she did not have material enough of the kind to fill out the mould, so took some finer grained stuff prepared for a woman and found that

'She could not have hit a more excellent
plan
For making him fully and perfectly man.'

"He had a fine humor, a genial disposition and a winning manner that made him a most delightful companion. Acquaintance with him soon ripened into friendship of a deep and enduring character. It was in the order of Nature that he should be taken from us, but we cannot realize yet that we shall see him no more.

"We shall miss him at the counsel table and the haunts where he was such a welcome presence, but his services, his life and character, have become a part of that ethereal entity, made up of many elements, which we call the University, and which will last, we trust, as long as time endures."

The following memorial was drawn up and unanimously adopted by the Board of Trustees:

Lucius B. Wing, a member of this Board of Trustees, was born at Wilmington, Vermont, November 15, 1822, and died at Newark, Ohio, February 1, 1902.

His parents were Bani and Thirza Flint Wing, whose ancestors came to this country in 1632 and identified themselves with the new colony which came a few years earlier in the Mayflower.

His father enlisted in the War of the Revolution in 1779, when seventeen years of age and was present at the execution of Major Andre in 1780.

Mr. Wing was the youngest of a large family, and at the time of his death was one of the few surviving sons of Revolutionary fathers.

His education was received in a rude country school in the Green Mountains, in the public schools of Wilmington, Vermont, and at Williston Academy, East Hampton, Massachusetts. After leaving the academy he taught school for a while at Charlemont, Massachusetts. From 1847 to 1853 he was clerk and manager of the "De Witt Clinton," a steamboat plying between Buffalo and Toledo, making the trip once a week. In December, 1853, he located in Newark, Ohio, and engaged in business as a dealer in live stock. About this time he went to Illinois and in association with Bodman Brothers of North Hampton, Massachusetts, located 4000 acres of land, taking 1000 in his own name. He retained his residence at Newark, Ohio, and continued his business as a stock dealer for a number of years.

In the meantime he gave much attention to the improvement of his Illinois land and soon made it a fine stock farm. In 1860 he went into the banking business at Newark, Ohio, with which he continued his connection up to the time of his death.

Mr. Wing was married in 1855 to Mary M. M. Mahew, a daughter of Captain George Mahew of Charlemont, Massachusetts, a lineal descendant from Thomas Mahew, the patentee and governor of Martha's Vineyard and Nantucket.

Mr. Wing's public service began in 1878, when he was elected a member of the State Board of Agriculture. He was re-elected to this office in 1879 and again in 1880, and that year was elected president of the Board. In 1881 he was appointed trustee of the University, was reappointed in 1888 and again in 1895, and at the time of his death had nearly completed twenty-one years of service as a member of this Board.

Mr. Wing was a Republican in politics and in 1885 was a candidate for senator in his senatorial district, but failed of election by 128 votes. In 1896 he was a presidential elector on the Republican ticket and in the electoral college of Ohio cast his vote for William McKinley as president.

Mr. Wing's first appearance as a member of this Board of Trustees was at the June meeting of 1881, at which meeting he was elected a member of the executive committee. All the years of his service except one he was a member of this committee, and at the time of his death had nearly completed fifteen years of continuous service as its chairman.

He was also a member of the farm committee during his entire service. He was elected president of the Board in 1886 and again in 1893.

Mr. Wing brought to the service of the University, rare tact, strong common sense, good judgment, and a ripe business experience. Coming so recently from the State Board of Agriculture he at first regarded himself as a special representative of the agricultural interests of the State. He stood firmly for making adequate provision for teaching the branches relating to agriculture and it was mainly through his efforts that the Department of Agricultural Chemistry was established and the Department of Agriculture otherwise strengthened and expanded. He believed that under the land grant of 1862, agriculture and the mechanic arts were to have the first and most prominent places in the curriculum of the institution, and his chief interest was in that direction. But

his mind soon broadened to the conception of an institution where all branches of science and learning could be taught in sympathetic and harmonious connection, and to this idea he afterwards gave his unwavering support.

He was prompt in his attendance at meetnigs of the Board and committees, and esteemed such attendance both a duty and a pleasure.

In the deliberations of the Board he was never unduly aggressive and while firm in his opinions he always respected the opinions of others. He was fair and impartial in his judgments and at all times open-minded to new facts or arguments. He was a model trustee.

In his personal relations towards his associates he was always cordial and friendly. He inspired a respect and confidence which deepened into warm personal attachment.

Our sense of the loss that the University sustains in his death is mingled with a keen sense of personal bereavement.

We tender to his bereaved widow and children our heartfelt sympathy in their affliction, and trust that their grief may be softened by the contemplation of a life of such noble and devoted service for the public good.

Farming as a Business.

In any occupation, one of the leading essentials to success is the strict adherence to business methods. Who will not admit this when applied to the mercantile occupations? Many farmers are just beginning to realize that their occupation is not merely their last hope for existence, but a business, and one of which it may be said, none is more honorable and profitable.

The practice of bookkeeping on the farm is, as yet, quite limited, but is gradually finding a place among our more progressive farmers. What would we say of a merchant who kept no books? And how different is the situation of the farmer from that of the merchant? There is hardly any difference except that the merchant's goods cost him money, while the farmer's goods cost him labor. The merchant does not calculate his profits upon his business as a whole, but aims to gain something upon each commodity handled. It is quite evident that the average farmer does not do this. If he did, we would not find, throughout the State, so many milch cows which do not give sufficient returns to the owners to compensate them for the food consumed, or so many acres of unprofitable land which are annually planted to crops which scarcely pay the taxes. If other business men avoid such practices, why should not the farmer do likewise? In too many cases, he does not know how much his products cost him; whereas, if he keeps an account, he may readily determine where these leaks on his farm are located.

Another common instance clearly showing a lack of business application among farmers is presented to us as we pass through the farming regions and see machinery and tools of all kinds standing out in the weather, when with slight effort or cost, shelter could be provided. This is due very frequently to the habit of considering only the first cost. A still greater loss is observed where fields, devoid of vegetation, are allowed to pass through the winter months in that condition instead of being planted to some good cover crop, which would serve not only to retain much of the fertility which would otherwise be washed away, but also to add considerable humus for succeeding crops. Such extravagant practices, and we regret to say that they are very nu-

merous, certainly are not characteristic of a business man.

It was once a common expression that any fool can farm; but, we no longer hear that. We are more apt to hear that it is foolish for anyone to attempt to farm, unless he knows more or less of the principles which underlie the science of agriculture. The time is past when man can sow his seed and wait upon nature to produce, almost unassisted, a bountiful harvest. He must now look upon farming as a business which requires considerable mental equipment in order to be reasonably successful. He must seize every opportunity to save time and labor by the use of the best and latest approved methods and machinery of the present time. He must remember that he is never too old to learn and most of all must bear in mind that he owes a considerable amount of time and interest to the promotion of the welfare of the public.

C. M.

"THE COW PEA" is the title of the latest publication issued by the Experiment Farm of North Carolina State Horticultural Society at Southern Pines, N. C. This book neatly bound and illustrated in plain and concise manner, discusses the value and importance of this crop, the Cow Pea. Every reader can get a copy free by writing to the Superintendent of Experiment Farm, Southern Pines, N. C.

The State Historical Society of Illinois has appointed a committee to ask the State World's Fair Commission to set aside $50,000 of the $250,000 which has been appropriated for the Illinois Exhibit at the Louisiana Purchase Exposition to be used in decorating the interior of the Illinois building with paintings and frescoes illustrative of events in the State's history.

The Dairy School.

Dairy Notes.

The close of the Dairy School for the class of 1902 is approaching and the students are considering positions. About twenty calls for dairymen were received by Professor Decker during the month of January. C. N. Breese will take charge of the new creamery at Lithopolis, and Clifford Tarpning will take charge of the Summit Station creamery.

The district around Columbus is becoming one of the dairy centers of the State. There are now seventeen creameries and four skimming stations built, and a new creamery in process of construction, within twenty-five miles of the Capital City.

OLEO LEGISLATION IN OHIO.

Early in the session of the legislature Mr Burghager, from Cincinnati, introduced a bill known as H. B. 163, to license manufacturers and dealers in oleo in the State of Ohio. The wording was such that the present color law would have no effect and the bill has been killed, and another accepted by the originator that will put heavy license fees on dealers and manufacturers, but does not interfere with existing laws.

IN CONGRESS.

In Congress a number of oleo bills were introduced. The committee reported a bill which was in every respect like the old Grout bill. An amendment was attached to it providing for the inspection of process butter factories by the U. S. Department of Agriculture, and the branding of the product in such a way as the Secretary of Agriculture may direct. The bill as amended was passed by the lower house of Congress by a good margin. The bill is now just where it was then when it was talked to death last year.

One of the new creameries near Columbus is one that was started last summer by W. Z. Evans in the city of Delaware. It is located in an old stone factory building which makes it cool and solid. A good equipment has been installed and a good article of butter is being turned out. The fact that there are two hundred and forty farmers sending milk there indicates that the farmers are interested in it. A number who started in with a few cows will increase to dairies of twenty cows.

D. A. Crowner last year resurrected the West Jefferson Creamery which has been idle for some time. Under his management the farmers in that locality are taking courage and will increase the milk supply. New machinery will be installed, among which will be a Simplex combined churn and butter worker.

The State Dairymen's Convention was held in Townshend Hall, February 5, 6 and 7. The attendance was the best that the association has had. At some of the sessions there was "standing room only," and the program went off with interest from start to finish. The cheese exhibit was only fair, but the butter exhibit was large and of fine quality. On Thursday afternoon the judges took the members into the exhibit room and pointed out defects and answered questions about market requirements. It was worth the expense of coming to Columbus to hear this one discussion.

Gold medals were awarded as follows: To S. R. Miles of Degraf, Ohio, for the best tub of creamery butter. The judges pointed out that another tub would have secured the medal if it had been put up as neatly as the tub from Degraf. F. M. Wilson of Selma, Ohio, was awarded the gold medal for dairy butter.

The Triumph Dairy Company represented by E. S. Rice was awarded the gold medal on cheddar cheese. The rules would not admit any cheese that had been bored and Mr. Rice had entered another cheese for scoring that was better than the one that won the medal. A cheese was secured from A. E. Helmer of Evans Mills, N. Y., who took first prize at the last Ohio State Fair, and this was cut with the medal cheese before the convention.

The gold medal for Swiss cheese was awarded to the Diamond cheese Company of Vermillion, Ohio.

United States Forest Reserve.

The woodland and forest may be considered from two points of view; first, as a source of lumber supply, and second, as a physical factor with effects upon climate, erosion, and the flow of streams.

The study of the forests of this country has been carried on almost entirely upon the botanical side. Our forests have been studied thoroughly and exhaustively by botanists, but the geographic and economic sides of the question have received very little attention, except for purely commercial purposes. Even such elementary facts as the extent of woodland in this country we know only in a broad, general way, except for certain limited areas which have been mapped in connection with topographic surveys. Of the amount of standing timber available for our use we know almost nothing. In view of the agitation for the protection of our forests, which has been going on for at least a generation, and which has grown so in intensity as to become with many persons almost a religion, it is strange that there should be practically no knowledge to serve as a basis for such a movement.

It is in order to get better acquainted with the forests and woodland, and to

get accurate data as to the kind and amount of timber in the various portions of the United States, that the United States Forestry Bureau has been established. In order to facilitate this work, as well as to preserve good examples of the various types of timber land, the Forest Reserves have been set apart in various portions of the country, and the conditions in these timber reserves are being carefully worked over both by the Forestry Bureau and the Geological Survey.

On account of the scenery and other natural points of interest, the forests of the western part of the United States have been more thoroughly studied than those of the eastern. This may also be due in good part to the fact that the eastern forests practically disappeared before the country awoke to the needs of forest study and preservation. Hence, the greater number of forest reserves in the Western United States and therefore a vastly greater amount of data concerning this region.

The forests of the Rocky Mountain region and the Pacific coast are characterized by an almost entire absence of deciduous trees. Indeed, almost all tree growth available for commercial purposes is composed of Coniferæ, consisting of pines, firs, spruces, hemlocks, cedars, and larches.

The distribution of tree growth, here in the west, is as everywhere else, dependent in the greatest degree on the climate, especially rainfall. The species which can bear the least rainfall are piñion pine and the juniper. Thus in going from a region of small rainfall toward a region of great rainfall, one passes through areas occupied by different species, from the piñion and juniper, through quaking aspen, yellow and lodgepole pine, to red fir, spruce, and cedar. Since throughout the Rocky Mountain region the rainfall is least in the valleys, and generally at low levels, the forests are, except near the Pacific coast, confined almost entirely to the higher plateaus and mountains. Thus they form a kind of zone, having for its lower limit the altitude of sufficient moisture for tree growth, and for its upper boundary the timber line as determined by temperature and elevation. Hence, from the above, it will be seen, that a rainfall map is in a general way a forest map; and in the Rocky Mountain region, since rainfall is more abundant at the higher elevations up to a certain limit, a relief map is, in like manner, a forest map.

Numerous exploring expeditions of the General Government have brought us data from this western regon and the following is in a general way the condition of the forests in a few of the western States:

The forests of South Dakota are confined to the Black Hills, where they consist almost wholly of yellow pine. They are mainly open forests, of no great density, and with little undergrowth. In portions of this region, especially toward the south, the timber is more in small bodies with open parks and glades intervening.

In Montana, as would be expected from the climate and topography, the forests are confined mainly to the western part of the State, and therefore, mainly to the mountains. The wooded area increases in density westward and northward, becoming densest in the Bitter-root region, the Front range, and the numerous intermediate ranges. The timber consists mainly of red fir, yellow pine, white pine, and tamarack. Southward the character of the forest gradually changes, being composed of the tall, straight, aptly named lodgepole pine.

In Wyoming the heaviest forests are found in the western portion, including Yellowstone Park and the country to

the east and south. The principal forest tree over this region is lodgepole pine, of small size, and of little economic importance. It is densest in Yellowstone Park and becomes sparse eastward and southward. The Bighorn Mountains are sparsely timbered, bodies of timber alternating with open parks, so that not more than half of the plateau like summit is wooded. The only other wooded areas in the State are near the southern border, where the great Colorado ranges project north of the State line, and upon these the timber is small and scanty.

In Colorado and New Mexico the timber is confined maily to the high mountain ranges and plateaus, the parks and valleys not being wooded. Nowhere is the timber growth very dense, and it consists mainly of red fir, yellow pine, Engleman spruce, and lodgepole pine.

In Arizona the principal body of timber is the San Francisco Forest. It is an open forest of good sized yellow pine, with little or no underbrush. A similar forest is found upon the high plateau on both sides of the Grand Canyon of the Colorado. The ranges south of the Colorado Plateau, about the heads of the Gila, contain some forest, but none of commercial importance.

In Utah the only timber worth mention is found in the Uintah range, in the northeast portion of the State. Upon the Wasatch range the timber is small and scattering.

In Nevada there is but a trifling amount of timber. The timber belt of the Sierra Nevada extends over a small area in the western portion, while elsewhere the only arborescent growth is near the summits of the narrow desert ranges.

The northern portion of Idaho is heavily timbered. This heavy body of timber extends down through the Bitterroot Reserve and gradually thins out south of Salmon River. There is a little timber in the southwestern part, but this is not of importance except for local purposes.

The portion of Washington west of the summit of the Cascade Range was formerly entirely covered with dense forests of great trees—firs, spruce, cedar, and hemlock—although a large proportion of it, almost half, has been destroyed either by cutting or burning. The eastern slope of the Cascades is less heavily timbered, but is not an unimportant source of forest products. East of the Cascade Range and north of the Columbia is a region whose forests are only second in density to those of Western Washington. The timber in this region consists mainly of white and yellow pine, with some red fir.

In Oregon the distribution is very similar to that of Washington. West of the summit of the Cascade Range the forests are dense and very productive, consisting of the same species as in Washington, with the addition in the southern part of a little sugar pine and yellow pine. The eastern slope of the Cascade Range is much less heavily forested, although the timber, which here consists of yellow pine almost exclusively, extends far out on the plateau. In the northeastern portion of the State are the Blue Mountains, whose forests consist largely of yellow pine, covering enormous areas with a rather light growth.

In California the Coast Ranges, from the Oregon boundary nearly down to the Bay of San Francisco, are well forested, mainly with red-wood, red fir, and yellow and sugar pine. Into the northern part of this area, spruce and hemlock extend southward from Oregon.

Upon the west slope of the Sierra Nevada are found, mainly between the altitudes of 4,000 and 8,000 feet, enormous quantities of sugar pine, which here grows to great size, yellow pine,

and red fir, with occasional groves of Sequoi gigantea. In the San Gabriel, San Bernardino, and San Jacinto Mountains are small areas forested with yellow pine, among which are interspersed a few sugar pines. Thus we have given a brief outline of the forest regions of Western United States, and in a continuation of this subject will go more into detail as to the amount and species of forest trees found in this portion of the United States.

EDWARD D. COBERLY.

A Visit to the Rogers' Stock Farm.

The advanced class in Zootechny, together with Professor Hunt, Mr. Ruhlen and Mr. Miller, spent Saturday, February 22, at the Rogers farm near Bloomingburg. The estate includes about 1800 acres of the finest land in Fayette County, and is devoted almost entirely to the feeding of beef cattle. It is under the direct management of Mr. Joseph D. Rogers, and there are at present about 350 cattle on the farm, most of which were purchased for feeding purposes. About half the number are cattle from the X. I. T. range in Northern Texas, which supports 50,000 head, the numbers being about equally divided between Shorthorns, Herefords and Angus.

The remainder of the Rogers' cattle are from various sources, some of them being from Kentucky and some from Kansas. They are divided into several herds according to age and size, and are fine specimens of the typical beef feeders.

Mr. Rogers entertained the visiting party most royally, and the day was spent looking over the immense farm. The party returned to Columbus in the evening, after a most pleasant and profitable day.

The Need of a Domestic Science Training.

There are few subjects of more importance to man's well being than the selection or preparation of his food. Food retards or advances the work of the mind and therefore retards or advances civilization, to no small degree. Shall we despise the power that builds us up and enables us to have strength to labor? A practical recognition of the value of proper food to the individual in maintaining a high standard of health and in prolonging healthy life, and thus largely promoting cheerful temper and improved moral tone, would achieve almost a revolution in the habits of many people.

The office of food then, is to keep the body in a condition of health and to enable it to exert force in doing the work of the world. The value of food depends upon its preparation, and upon its preparation depends health, and health is essential to the success of any undertaking in life. Food is cooked to render it more easily digested, to develop its flavors, making it more palatable, and to destroy any disease germs. How many of us realize the importance that is attached to the right preparation of any article of food? How many know that food, though containing much nutriment, is rendered almost, if not entirely useless by improper preparation, or that the nutritive value of a food may be increased by the way it is cooked. The power of man to do work depends upon his nutrition to a large degree; a well-fed man has strength of muscle and brain which a poorly-nourished man has not. Professor Atwater says, "with the progress of human knowledge and human experience we are coming to see that the human body needs the closest care, coming to realize that not only our health, our

strength and our incomes, but our higher intellectual faculties depend upon the care we take of our bodies, and that among the things essential to health and wealth, to right thinking and right living, one, and that not the least important is our diet."

Will not a knowledge of chemistry, botany, physiology and bacteriology help the women who are the ones who must face these important questions and make a practical application of them in the home,—this most important institution which more than all else molds the character and destiny of men? The home is necessary to the life of the family and to the development of good citizens, and since woman makes the home, the training for this important position should begin early. If definite and careful instruction in the principles on which agricultural practice is based is necessary, is not the same true of domestic science? It should include a knowledge of the elements and compounds in foods, their digestibility and value as tissue and heat producers, the changes which take place in their composition during cooking, and a knowledge of how best to secure advantageous change in the most attractive form. The work should also include sanitation of food supply as well as other factors which make up our complex home life; should include chemistry of nutrition, and teach how during illness foods may be most easy of digestion. Is there not as much education required to successfully conduct the business of housekeeping as other business enterprises? Lack of good generalship is one of the causes of the present chaotic conditions of many households, and it is hardly possible that things will be different until housekeepers are educated. Housekeeping cannot be conducted with success by chance or ignorance, but must be governed by exact knowledge. It is not merely knowledge of history, art and literature, but knowledge of practical things of everyday life that women need.

The application of science to daily life must come into the curriculum of the higher education for women, if we are to see the best development of the race. Does it lower the standard of any of the arts and sciences that we can and do apply them to our daily work and wants? We must learn how to make scientific knowledge minister to the health and happiness, and to the social elements of life. The woman capable of directing her own household in harmony with economic law and industrial progress can also take her place as a factor in the general progress of civilization. To be a permanent factor in civilization woman must become a capable being. She must not only be able to practice cooking, sewing and cleaning but be trained to think. With thinking and working together, the powers are developed toward a well-rounded capability to meet all problems of home and social life which she may encounter. If hand and brain are trained together, can we not as poets have done, make poems and pictures of some of the every-day work of our lives? As has been said, "were there no skilled hands to express the thoughts of the brain, of what avail would be the most practical or highest or most artistic conceptions of the best minds?"

Some one has said that the object of all education is to prepare men and women for the duties and pleasures of life. If the culture studies alone secured these ends there would be no need to ask for technical training, but past experience has proved that it does not. In all countries, the majority of the people must labor with their hands as well as brains, and when training of brain and hands go together, the result must be

most satisfactory. Has not that training fallen short of the ideal which does not fit the individual for the highest and noblest duty in life? L. B. C.

Lime as a Soil Ameliorant.

The use of lime compounds for manuring purposes is of very ancient origin. Pliny, in his writings mentions the use of calcareous matter for this purpose as if it were no uncommon thing, and the use of both marl and burned lime was a very important factor in the development of European agriculture. In America its use has been of less importance, although it has been used to a considerable extent upon certain classes of soils, especially in the Eastern states. However, its use has been limited almost entirely to those sections where limestone was abundant and the burned lime could be obtained cheaply.

The action of lime within the soil is of a double nature, being both chemical and physical in character.

The chemical action is exceedingly complicated and is in considerable part only imperfectly understood, owing to the extreme complexity of the compounds existing within the soil. There are however, certain well marked effects which are often of considerable value. In the first place it should be said that the value of lime as a direct fertilizer is of little consequence as a rule, since most soils contain a sufficient amount for the use of plants. There are soils, however, even of limestone origin, from which the lime has been so thoroughly leached as to render them quite deficient in this constituent. In such cases, there is a strong tendency for the soils to become sour, especially those which contain a considerable amount of decaying organic matter, because of an insufficient amount of alkaline compounds present to neutralize the acids formed.

Wheeler found that even the upland soils of Rhode Island containing only a moderate amount of organic matter, were in many cases distinctly acid, and consesequently responded well to liming.

One of the most important of these chemical effects of lime in the soil is that of setting free plant food, notably potash, from certain more or less insoluble compounds. Potash is often held in the soil in the form of a double silicate of aluminum and potash, in which condition it is but slowly made available to plants. The action of the lime is to take the place of the potash in the silicate, thus setting it free for the use of plants.

Again, unless present in excess, lime aids in maintaining in a more available form, the phosphoric acid present in the soil by the formation of calcium phosphate, which is more available to plants than are its compounds with iron and aluminum in which it is usually found.

Another action, closely connected with that of neutralization, is that of aiding in the decomposition of organic matter, both with respect to nitrification and in the direct decomposition of organic compounds. It is often used for this purpose upon soils which are highly organic in nature and in compost heaps where a rapid decomposition is desirable.

The physical effects of lime are quite as important as the chemical, and in certain cases are of much greater value. It acts physically upon both heavy and light soils, although the actions are almost exactly opposite in character, tending to the production of a more open, friable condition of the former and of a more compact and retentive condition of the latter. Its effect upon heavy soils is however, of most importance, and is due to its property of flocculating the finer particles or drawing them together into masses which then behave much as distinct soil grains would do. The action

then is equivalent to increasing the size of soil grains in close-grained, heavy soils, thus making them more open in character and much less stiff and adhesive. The result is a soil which is more permeable to water, more easily drained, better aerated, and one in which the capillary conditions are greatly improved. In short, it gives a loamy character to the clay and in so doing tends to lessen to a considerable extent, the various ills to which a heavy clay soil is heir. Practically, however, quite a large amount of lime is often necessary to exert this ameliorizing influence upon the more heavy clay, and farmers are frequently disappointed in its use.

On light soils lime has an effect quite different from that upon clays, consisting of a binding together of the soil grains, due to a coagulation of organic matter within the finer openings and to a binding action somewhat analogous to that of lime in mortar. The effect is to make the soil more compast and more retentive of moisture, which is quite an important consideration in localities where the soil is light and loose. Practically, however, this action is not sufficiently marked to be of much importance except in certain cases, and it is only where a considerable amount of organic matter is present that the action is of any great value.

On the whole, the action of lime is an exhaustive one where it is used for the purpose of setting free plant food, and in this respect it may easily be used to excess. Its rational use for this purpose, however, is quite in accord with the best agricultural practice, and its value as an ameliorant for heavy clay is by far too little known.

The amount of lime to apply, depends upon the form in which it is applied, upon the soil and upon the purpose of its application.

The most active form is that of the oxide, or what is known as caustic lime. The best form in which to apply it, however, is that of the hydrate, which, although somewhat weaker in its action, is much more safely handled and easily distributed. A practical method of using it is to place the caustic lime in piles and cover with moist earth which causes it to slake within a few days and fall to a fine powder and it is then easily distributed. In case the soil with which it is covered does not contain sufficient water to completely slake it, a few pailsfull may be thrown upon the heap.

The amount of this form of lime to apply may vary from a few hundred pounds up to several tons, depending entirely upon conditions. Usually the application of fifty bushels per acre, in six to ten years is sufficient on heavy soils, although on particularly stubborn clays the application of several tons may be necessary to bring about the desired result. Quite often, however, a very stiff soil will show a marked improvement when a comparatively small amount is used. On light soils more frequent and smaller applications will be desirable.

Lime may be applied to cultivated ground, or in lighter quantities it may be used as a top dressing on grass or clover lands. In the latter case it should be applied in late summer or in the fall..

When used in large quantities it is best to apply to cultivated ground some time before a crop is to be planted, and it should be thoroughly worked into the soil, preferably by harrowing.

It must be remembered that injurious effects often result from the use of lime, and care should be used in its application. It is sometimes injurious to sandy soils where applied in too large amounts, because of a burning out of the organic matter, while the use of caustic or freshly slaked lime on young crops may be

of direct injury to the plants. Again, certain plants are injured by the use of lime while others are greatly benefited. Wheeler found on the Rhode Island soils that watermelons and lupines were especially injured while most other plants were benefitted. Clover and certain other legumes have long been known to respond favorably to lime, probably because of its action in setting free potash.

It is quite true that the use of lime among the farmers of the country is being neglected to a considerable extent. There are undoubtedly many localities where the soils have a tendency to become more or less acid and where the use of lime would be of great value. Again its value in ameliorating the physical conditions of heavy clays is not sufficiently appreciated, and where it may be obtained cheaply there is no reason why it should not come into more general use. M. F.

From Bulletin of Experiment Station, Manhattan, Kan., January 21, 1902.

The superiority of our present varieties of plants over those grown even within the memory of those of us in middle life, is very great in many instances. The results achieved with some are indications of those that are possible with many, perhaps all. In the case of staple crops the improvement possible, even if it should prove to be but in small degree, may in the aggregate be of great economic moment. Seedsmen and farmers naturally give their attention to the external and physical qualities and the yield, rather than to the chemical composition. The Chemical Department of the Experiment Station has shown that there are significant differences in the composition, not only of different varieties of corn, but in that of different ears of the same variety, and even of the individual kernels of a given ear. Analysis by the Kansas Station and by others have shown that the germ is much richer in nitrogen than the rest of the kernel. By selecting as seed, from year to year, the ears of corn in which, as a rule, the kernels possess larger germs, a strain can be secured which will be richer in nitrogen, as this station and others have abundantly shown that this property is inheritable. By making cross-sections of the tips of a number of kernels from each of several ears, it is quite feasible to select the ears which are richer in nitrogen. It is said that inspection enables one to select corn in which the parts of the kernel exclusive of the germ are richer or poorer in starch, and consequently, poorer or richer in nitrogen, respectively. While this may be true, it seems to be less easy of application, and less practical, as feeders prefer corn that is not hard and flinty, even though it may contain less nitrogen. There is no similar difficulty complicating the selection of corn by the size of the germ, other things being equal. In fact, larger germs add to the value of corn by their much higher percentage of fat as well as by their higher percentage of nitrogen.

The station is making efforts to establish improved varieties of corn, selections being based, in part, on the percentage of nitrogen, and with as much success as could reasonably be expected, in view of the almost total failures of the crops on account of drought the last two years. The ease with which corn cross-fertilizes makes these experiments very difficult, especially when any effort is made to obtain a considerable quantity of a given variety in a state of purity.

That corn would be an appreciably more valuable grain for feeding, if it were richer in nitrogen, there can be no

reasonable doubt, and the farmer who will systematically set about developing a strain of an otherwise good variety that is richer in nitrogen, will be a public benefactor, and doubtless will reap an ample financial reward.

EARTH ROADS.—The question of good roads is one that at present is receiving much attention, and under the direction of experts of the Office of Public Road Inquiries of the U. S. Department of Agriculture, sections of roads, as object lessons, are being built in different parts of the country. It is hoped that before many years all roads in the United States used for heavy traffic will be macadamized, graveled, or otherwise improved. But the absence in many places of rock, gravel, or other hard and durable substances with which to build good roads, and the excessive cost of such roads where suitable material is scarce, will necessitate the use of earth roads for many years to come. Under favorable conditions of traffic, moisture, and maintenance the earth road is the most elastic and most satisfactory for pleasure and light traffic.

The U. S. Department of Agriculture has in press and will soon issue Farmers' Bulletin No. 136, entitled "Earth Roads." It was prepared by Maurice O. Eldridge, Assistant Director, Public Road Inquiries.

The bulletin states that the aim in making a road is to establish the easiest, shortest, and most economical line of travel, and that it is therefore desirable that roads should be firm, smooth, comparatively level and fit for use at all seasons of the year. They should be properly located so that their grades shall be such that loaded vehicles may be drawn over them without great loss of energy; properly constructed, the roadbed graded, shaped, and rolled, and surfaced with the best available material suited to their needs.

Attention is called to various errors in laying out roads, especially the common error of endeavoring to secure routes covering the shortest distance between fixed points. For this purpose the road is often made to go over a hill instead of around it. A road halfway around a hill or through a valley is sometimes no longer than a road over a hill or through a valley. The difference in the length even between a straight road and one that is lightly curved is less than many suppose.

The importance of proper drainage is pointed out and suggestions are given for the construcion, maintenance, and repair of earth roads.

The bulletin contains twenty illustrations. It is for free distribution, and copies will be sent to any address on application to Senators, Representatives, and Delegates in Congress, or to the Secretary of Agriculture, Washington, D. C.—From Department Bulletin.

THE IDEAL COUNTRY HOUSE.—In the Delineator for February Alice M. Kellogg describes a small and very desirable country house. One of the best features of the house is that the kitchen and servants quarters are quite distinct from the other rooms. Not only are floor plans of the house given, but the building completed and numerous photographs of the various rooms artistically furnished, so that the prospective builder cannot only see the way the exterior will look, but can get ideas for the proper furnishing of the interior.

Senator Bacon, of Georgia, who has just returned from a tour of study in the Philippines, has written for The Saturday Evening Post of Philadelphia, a valuable paper on the business aspect of our insular affairs. He comes to the conclusion that our account with the Philippines must, for an indefinite time, be on the wrong side of the ledger. This article will appear in the issue for February 22.

HIGHEST AWARD

Cream Separators

BUFFALO EXPOSITION.

Just as in the case of every representative exhibition or other contest since the invention of the Cream Separator twenty years ago, the De Laval machines have maintained their supremacy at the Pan-American Exposition, Buffalo, having received the Gold Medal on Cream Separators.

This is the highest and only award of its kind on cream separators. One other make of machine has received a Silver Medal and another concern a Gold Medal for its *combined exhibit* of cream separators, Babcock testers, churns and other apparatus. With characteristic advertising honesty, the latter concern is now claiming this Gold Medal to be an award to its separators.

OTHER GREAT EXPOSITIONS.

The supremacy of the De Laval machines at Buffalo is a continuation of their triumphant record at all previous great expositions. At the World's Fair, Chicago, in 1893, they received the Gold and only medal awarded by the regular jury of awards and were the only separators used in the Model Dairy. At Antwerp, in 1894, and at Brussels, in 1897, they received the Grand Prizes or highest awards. At Omaha, in 1898, they received the Gold Medal, and again at Paris, in 1900, the Gold Prize or highest award.

The De Laval Separator Co.

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